

WARD CHRISTOPHER WHEELER
CURATOR AND PROFESSOR
DIVISION OF INVERTEBRATE ZOOLOGY

HIGHEST DEGREE EARNED

Ph.D.

AREA OF SPECIALIZATION

Molecular Systematics, Systematic Theory

EDUCATIONAL EXPERIENCE

Ph.D., Harvard University, 1985-1988

B.A., Yale College, 1981-1985

PREVIOUS EXPERIENCE IN DOCTORAL EDUCATION

FACULTY APPOINTMENTS

Adjunct Professor, Columbia University, 1991-present

Adjunct Professor, New York University, 1991-present

Adjunct Professor, City University of New York, 1989-present

COURSES TAUGHT

Systematics and Biogeography, Richard Gilder Graduate School, 2008

Molecular Evolution, Molecular Systematics, Tutorial in Molecular Evolution, Theory
and Use of POY

Phylogenomics--Aveiro, Portugal, 2007

Systematics—Copenhagen, Denmark, 2007

Systematics-Prohonice, Czech Republic, 2006

Systematics and Sequence Analysis, Helsinki, Finland, 2004

Molecular Systematics, Tucumán, Argentina, 2002

Computational Systematics, Espoo, Finland, 2001

Computational Systematics, Copenhagen, Denmark, 2000

DNA Sequence alignment et seq, Helsinki, Finland, 1999

Molecular Systematics, Uppsala Sweden; Helsinki, Finland, 1998

Molecular Systematics, Helsinki, Finland, 1995

Molecular Character Analysis, Tulgarn, Sweden, 1993

GRADUATE ADVISEES

Louise Crowley City University of New York , 2007-present

Andres Varon, City University of New York, 2003-present

Robert Schelly, Columbia University, 2000-2006

Taran Grant, Columbia University, 2000-2005

Julian Faivovich, Columbia University, 2000-2005

William Leo Smith, Columbia University, 2000-2005

Aloyisius Philips, Columbia University, 2002

Paul Vrana, Columbia University, 1994

Michael Whiting, Cornell University, 1995
Cheryl Hayashi, Yale University, 1996
Amy Litt, City University of New York, 1999

GRADUATE COMMITTEES

CHAIR

Louise Crowley City University of New York , 2007-present
Andres Varon, City University of New York, 2003-present

SERVED

Robert Schelly, Columbia University, 2000-2006
Taran Grant, Columbia University, 2000-2005
Julian Faivovich, Columbia University, 2000-2005
William Leo Smith, Columbia University, 2000-2005
Aloysius Philips, Columbia University, 2002
Amy Litt, City University of New York, 1999
Daniel Thornton, Columbia University, 1997
Benjamin Evans, Columbia University, 1997
Cheryl Hayashi, Yale University, 1996
Michael Whiting, Cornell University, 1995
Paul Vrana, Columbia University, 1994

RESEARCH GRANT SUPPORT

FEDERAL SOURCES

Department of Defense-DARPA, Novel analytical and empirical approaches to the origin and prediction of pathogenicity, \$980,000, 2009 - 2010
Google.org. The Supramap project: Linking and Google Earth and Genomics to Fight Emergent Infectious Diseases” \$25,000 2008
Army Research Office, Novel Analytical and Empirical Approaches to the Origin and Prediction of Pathogenicity, \$4,512,000, June 1, 2005-May 31, 2009.
National Science Foundation, Building the Tree of Life: A National Resource for Phyloinformatics and Computational Phylogenetics, \$506,621, October 1, 2004-September 30, 2008.
National Science Foundation, Collaborative Research: Assembling the Tree of Life: An Integrated Approach to the Origin and Diversification of Protostomes, \$146,676, January 1, 2004-December 31, 2005.
National Aeronautics and Space Administration, A Proposal to Train the Next Generation and to Enhance the Infrastructure for Education and Research at the Frontiers of Science, \$3,395,445, March 1, 2003-August 31, 2005.
National Science Foundation, ATOL: Assembling the Tree of Life: Phylogeny of Spiders, \$2,738,000, October 1, 2002-September 30, 2007.
National Science Foundation, Supplement: ATOL: Phylogeny of Spiders, \$17,800, October 1, 2002-September 30, 2007.

RECENT ARTICLES IN REFEREED JOURNALS (2003-2008)

- Wheeler, W. C. and G. Giribet. "Phylogenetic hypotheses and the utility of multiple sequence alignment," in M. Rosenberg eds., *Multiple Sequence Alignment*. in press.
- Schuh, R.T., C. Weirauch, and W.C. Wheeler. 2008. Phylogenetic analysis of family-group relationships in the Cimicomorpha (Hemiptera). *Systematic Entomology*, in press.
- Varon, A., and W. C. Wheeler. Application note: on extension gap in POY version 3. *Cladistics*, in press.
- Wheeler, W. C. and K. M. Pickett. 2008. Topology-Bayes versus Clade-Bayes in Phylogenetic Analysis. *Mol. Biol. Evol.* 25:447-453.
- Dunn, C. W., A. Hejnol, D. Q. Matus, K. Pang, W. E. Browne, S. A. Smith, E. Seaver, G. W. Rouse, M. Obst, G. D. Edgecombe, M. V. Sørensen, S. H.D. Haddock, A. Schmidt-Rhaesa, A. Okusu, R. M. Kristensen, W. C. Wheeler, M. Q. Martindale, and G. Giribet. 2008. Broad phylogenomic sampling improves resolution of the Animal Tree of Life. *Nature* 452:745-749.
- Murienne, J., R. Pellens, R. B. Budinoff, W. C. Wheeler, and P. Grandcolas. 2008. Phylogenetic analysis of the endemic New Caledonian cockroach *Lauraesilpha*. Testing competing hypotheses of diversification." *Cladistics* 24:1-11.
- Pickett, K. M., G. L. Tolman, W. C. Wheeler, and J. W. Wenzel. (In press) Parsimony overcomes statistical inconsistency with the addition of more data from the same gene. *Cladistics*.
- Smith, W. L. and W. C. Wheeler. (In press) Venom evolution widespread in fishes: A phylogenetic roadmap for the bioprospecting of piscine venoms. *J. Heredity*. In press.
- Pickett, K. M., J. M. Carpenter, J. Kojima, J. W. Wenzel, and W. C. Wheeler. (In press) The ancestor of paper wasps was not solitary. *Science*.
- Ogden, T. H., M. F. Whiting, and W. C. Wheeler. (In press) Poor taxon sampling, poor character sampling, and non-repeatable analyses of a contrived dataset do not provide a more credible estimate of insect phylogeny: a reply to Kjer. *Cladistics*.
- Arango, C.A., and W.C. Wheeler. 2007. Phylogeny of the sea spiders (Arthropoda, Pycnogonida) based on direct optimization of six loci and morphology. *Cladistics* 23:1-39.
- Giribet, G., and W.C. Wheeler. 2007. The case for sensitivity: response to Grant and Kluge. *Cladistics* 23: 1-3.
- Janies, D., A. W. Hill, E. Waltari, R. Guralnick, F. Habib, and W.C. Wheeler. 2007. Genomic analysis and geographic visualization of the spread of avian influenza. *Systematic Biology* 56: 31-39.
- Frost, D. R., T. Grant, J. Faivovich, R. Bain, A. Haas, C.F.B. Haddad, R.O. de Sá, S. C. Donnellan, C.J. Raxworthy, M. Wilkinson, A. Channing, J.A. Campbell, B.L. Blotto, P. Moler, R.C. Drewes, R.A. Nussbaum, J.D. Lynch, D. Green, and W. C. Wheeler. 2006. The amphibian tree of life. *Bulletin of the American Museum of Natural History* 297: 1-370.
- Ly Se, V., A. Varon, and W.C. Wheeler. 2006. Pairwise alignment with rearrangement. *Genome Informatics* 17: 141-151.

- Pellenes, P., C. D'Haese, X. Bellés, M.-D. Piulachs, F. Legendre, W.C. Wheeler, and P. Grandcolas. 2007. The evolutionary transition from subsocial to eusocial behavior in Dictyoptera: phylogenetic evidence for modification of the "shift-dependent-care" hypothesis with a new subsocial cockroach. *Molecular Phylogenetics and Evolution* 46: 616-627.
- Ramírez, M.J., J.A. Coddington, W.P. Maddison, P. Midford, L. Prendini, J. Miller, C.E. Griswold, G. Hormiga, P. Sierwald, N. Scharff, S.P. Benjamin, and W.C. Wheeler. (2007). Linking of digital images to phylogenetic data matrices using a morphological ontology. *Systematic Biology* 56: 283–294.
- Richter, S., J. Olesen, and W.C. Wheeler. 2007. Phylogeny of Branchiopoda (Crustacea) based on a combined analysis of morphological data and six molecular loci. *Cladistics* 23: 1-36.
- Wheeler, W.C. 2007. The analysis of molecular sequences in large data sets: where should we put our effort? *In* R. Hodkinson and J. A. N. Parnell (editors), *Reconstructing the Tree of Life: Taxonomy and Systematics of Species Rich Taxa*, 113-128 Oxford: Oxford University Press.
- Pickett, K.M., J.M. Carpenter, and W.C. Wheeler. 2006. Systematics of *Polistes* (Hymenoptera: Vespidae), with a phylogenetic consideration of Hamilton's haplodiploidy hypothesis. *Annales Zoologici Fennici* 43: 390-406.
- Wheeler, W.C. 2006. Dynamic homology and the likelihood criterion. *Cladistics* 22: 157-170.
- Wheeler, W.C. , M.J. Ramírez, L. Aagesen, and S. Schulmeister, 2006. Partition-free congruence analysis. *Cladistics* 22: 256-263.
- Wheeler, W.C., L. Aagesen, C.P. Arango, J. Faivovich, T. Grant, C. D'Haese, D. Janies, W.L. Smith, A. Varon, and G. Giribet. 2006. Dynamic Homology and Phylogenetic Systematics: a Unified Approach Using POY. *American Museum Novitates*. Pp 445.
- Faivovich, J., C. F. B. Haddad, P. C. A. Garcia, D. R. Frost, J. A. Campbell, and W. C. Wheeler. 2005. Systematic review of the frog family Hylidae, with special reference to Hylinae: Phylogenetic analysis and taxonomic revision. *Bulletin of the American Museum of Natural History* 294: 1- 240.
- Frost, D. R., T. Grant, J. Faivovich, A. Haas, C. F. B. Haddad, R. Bain, R. O. de Sá, S. C. Donnellan, C. J. Raxworthy, M. Wilkinson, A. Channing, J. A. Campbell, B. L. Blotto, P. Moler, R. C. Drewes, R. A. Nussbaum, J. D. Lynch, D. Green, and W. C. Wheeler. 2005. The amphibian tree of life. *Bulletin of the American Museum of Natural History* 00: 00-00.
- Prendini, L. and W.C. Wheeler. 2005. Scorpion higher phylogeny and classification, taxonomic anarchy, and standards for peer review in online publishing. *Cladistics* 21(5): 446–494.
- Prendini, L., P. Weygoldt, and W.C. Wheeler. 2005. Systematics of the *Damon variegatus* group of African whip spiders (Chelicerata: Amblypygi): Evidence from behaviour, morphology and DNA. *Organisms, Diversity and Evolution* 5: 203–236. [cover article]
- Favovich, J., P. C. A. Garcia, F. Ananias, L. Lanari, N. G. Basso, and W.C. Wheeler. 2004. A molecular perspective on the phylogeny of the *Hyla pulchella* species group (Anura: Hylidae). *Mol. Phyl. Evol.* 32:938-950.

- Giribet G., G. D. Edgecombe, J.M. Carpenter, C. d'Haese, W.C. Wheeler. 2004. Is *Ellipura* monophyletic? A combined analysis of basal hexapod relationships with emphasis on the origin of insects. *Organisms, Diversity, and Evolution*, 4:319-340.
- Schulmeister, D. and W. C. Wheeler. 2004. Phylogenetic analysis of developmental sequence heterochrony: an application of search-based character optimization. *Evolution and Development*, 6:50-57.
- Smith, W. L. and W. C. Wheeler. 2004. Polyphyly of the mail-cheeked fishes (Teleostei: Scorpaeniformes): evidence from mitochondrial and nuclear sequence data, *Mol. Phyl. Evol.*, 32:627-646.
- Norell, M. A., and W. C. Wheeler. 2003. Missing entry replacement data analysis: a statistical approach to dealing with missing data in paleontological and total evidence data sets. *J. Vert. Paleont.* 23:275-283.
- Prendini, L., Crowe, T.M., and Wheeler, W.C. 2003. The family Scorpionidae Latreille, 1802: Phylogeny, taxonomy and biogeography. *Invertebrate Systematics*, 17:185-259.
- Wheeler, W. C. 2003. Search-Based Optimization. *Cladistics*, 19:348-355.
- Wheeler, W. C. 2003. Implied Alignment: A Synapomorphy-Based Multiple Sequence Alignment Method. *Cladistics*, 19:261-268.
- Wheeler, W. C. 2003. Iterative pass optimization. *Cladistics*, 19:254-260.

SPECIAL RECOGNITION/AWARDS

Who's Who in America, 2007-2009

US Patent "A method for search-based optimization" #7043371, 2006

University of Helsinki Bronze Medallion, 1995

Sloan Foundation Postdoctoral Fellow, 1988-1989

National Institutes of Health Graduate Fellow, 1988

Willi Hennig Society: Don Rosen Award for best student paper, 1986

National Science Foundation Graduate Fellow, 1985-1988